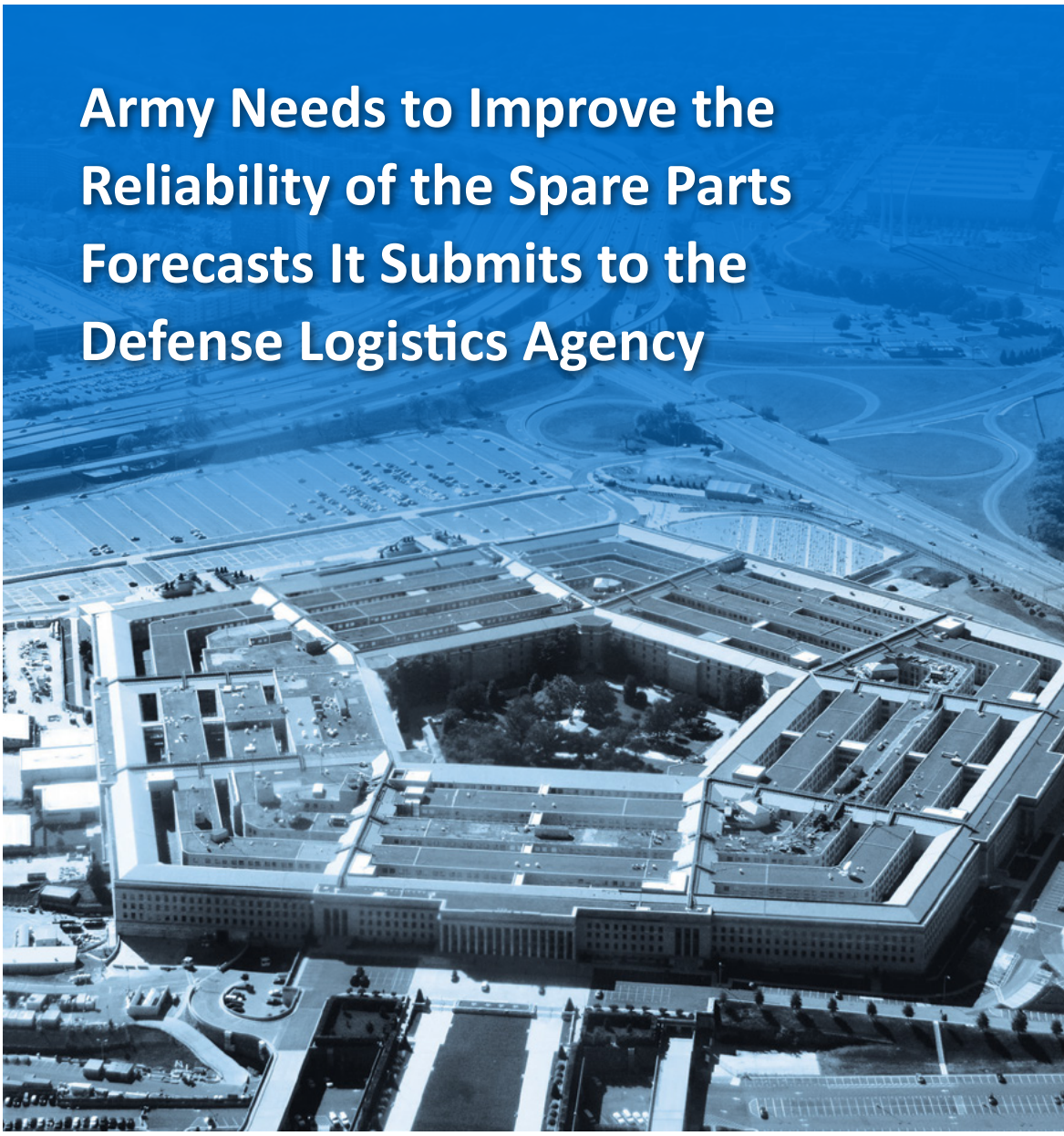
Report No. DODIG-2014-124

INSPECTOR GENERAL

U.S. Department of Defense

SEPTEMBER 29, 2014

Army Needs to Improve the Reliability of the Spare Parts Forecasts It Submits to the Defense Logistics Agency



INTEGRITY ★ EFFICIENCY ★ ACCOUNTABILITY ★ EXCELLENCE

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
29 SEP 2014		**00-00-2014 to 00-00-2014**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Army Needs to Improve the Reliability of the Spare Parts Forecasts It Submits to the Defense Logistics Agency	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Department of Defense Inspector General,4800 Mark Center Drive,Alexandria,VA,22350-1500**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**44**	

INTEGRITY ★ EFFICIENCY ★ ACCOUNTABILITY ★ EXCELLENCE

Mission

Our mission is to provide independent, relevant, and timely oversight of the Department of Defense that supports the warfighter; promotes accountability, integrity, and efficiency; advises the Secretary of Defense and Congress; and informs the public.

Vision

Our vision is to be a model oversight organization in the Federal Government by leading change, speaking truth, and promoting excellence—a diverse organization, working together as one professional team, recognized as leaders in our field.

For more information about whistleblower protection, please see the inside back cover.

Results in Brief

Army Needs to Improve the Reliability of the Spare Parts Forecasts It Submits to the Defense Logistics Agency

September 29, 2014

Objective

We determined whether the Army is reasonably forecasting Special Program Requirements for spare parts ordered from the Defense Logistics Agency.

Finding

Army Life Cycle Management Commands did not provide the Defense Logistics Agency with reliable forecasts of spare parts needed to support planned depot maintenance projects. Army depots did not order $142.7 million of the $226.4 million parts forecast for FY 2013. For other parts, depot requirements exceeded forecasts by $83.7 million. This occurred because Army policy and controls did not ensure Army Life Cycle Management Command and depot personnel:

- properly updated spare parts usage rates,
- correctly coded projects to select the appropriate list of required parts,
- properly coded specific spare parts to prevent erroneous forecasting, and
- maintained adequate supporting documentation and compared past forecasts to actual orders.

Unreliable Army spare parts forecasts cause the Defense Logistics Agency to either buy too many parts and incur unnecessary inventory costs or to buy too few parts,

Visit us at www.dodig.mil

Finding (cont'd)

which negatively affects depot operations and warfighter readiness. The Army forecast $705.3 million in spare parts requirements for FYs 2014 through 2016. Unless the Army improves its forecasts, it will continue to negatively impact the Defense Logistics Agency's purchase decisions, stock levels, and readiness.

Recommendation

We recommend that the Secretary of the Army develop Army-wide policy and establish controls on monitoring and updating depot overhaul factors consistently.

We recommend that the Commander, Army Materiel Command, develop a plan of action with milestones to improve the accuracy of the Army Life Cycle Management Commands' forecasts to the Defense Logistics Agency. The plan should address the problems this audit identified, to include:

- establishing procedures and controls to make sure that Life Cycle Management Command personnel use the correct parts lists for spare parts forecasting,
- establishing procedures and controls to ensure that depot personnel properly code spare parts to avoid generating erroneous forecasts to the Defense Logistics Agency and also correct existing erroneous forecasts, and
- developing a methodology for Life Cycle Management Command personnel to compare depot orders with associated special program requirements in order to ensure the reasonableness of spare parts forecasts.

Management Comments and Our Response

Comments from the Chief of Supply, Department of the Army, and the Executive Deputy to the Commanding General, Army Materiel Command, addressed the recommendations and no further comments are required. Please see the Recommendations Table on the back of this page.

Recommendations Table

Management	Recommendations Requiring Comment	No Additional Comments Required
Secretary of the Army		1
Commander, Army Materiel Command		2.a, 2.b, 2.c

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500

September 29, 2014

MEMORANDUM FOR SECRETARY OF THE ARMY
COMMANDER, ARMY MATERIEL COMMAND
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Army Needs to Improve the Reliability of the Spare Parts Forecasts it Submits to the Defense Logistics Agency (Report No. DODIG-2014-124)

We are providing this report for your information and use. Army Life Cycle Management Commands did not provide the Defense Logistics Agency with reliable forecasts of spare parts needed to support planned depot maintenance projects.

We considered management comments on a draft of this report when preparing the final report. DoD Directive 7650.3 requires that recommendations be resolved promptly. Comments from the Chief of Supply, Department of the Army and the Executive Director to the Commanding General, Army Materiel Command, addressed all specifics of the recommendations, and we do not require additional comments.

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9077 (DSN 664-9077).

Jacqueline L. Wicecarver

Jacqueline L. Wicecarver
Assistant Inspector General
Acquisition, Parts, and Inventory

Contents

Introduction

Objective

The audit objective was to determine whether the Department of the Army is reasonably forecasting Special Program Requirements (SPRs) for spare parts ordered from the Defense Logistics Agency (DLA). Specifically, the audit reviewed the SPRs that the Army Materiel Command's (AMC) Life Cycle Management Commands (LCMCs) submit to DLA to support planned depot maintenance programs. See Appendix A for our scope and methodology, use of computer-processed data, and prior coverage of the Army SPR process.

Forecasts are means of calculating the likelihood of future events occurring, based on analyses of available data. We focused on determining whether the spare parts forecasts were reliable, including determining whether the Army's process used the best available information to prepare forecasts in accordance with DoD policy. We also focused on determining if the Army's forecasting process functioned as designed. We acknowledge that several factors can impact the timing and extent of planned depot maintenance projects including higher priorities, shortage of parts, and associated work stoppages. Because of these factors, the depots may order a different amount of parts and may order them sooner or later than forecast. We considered these factors when evaluating the reliability of the forecasts.

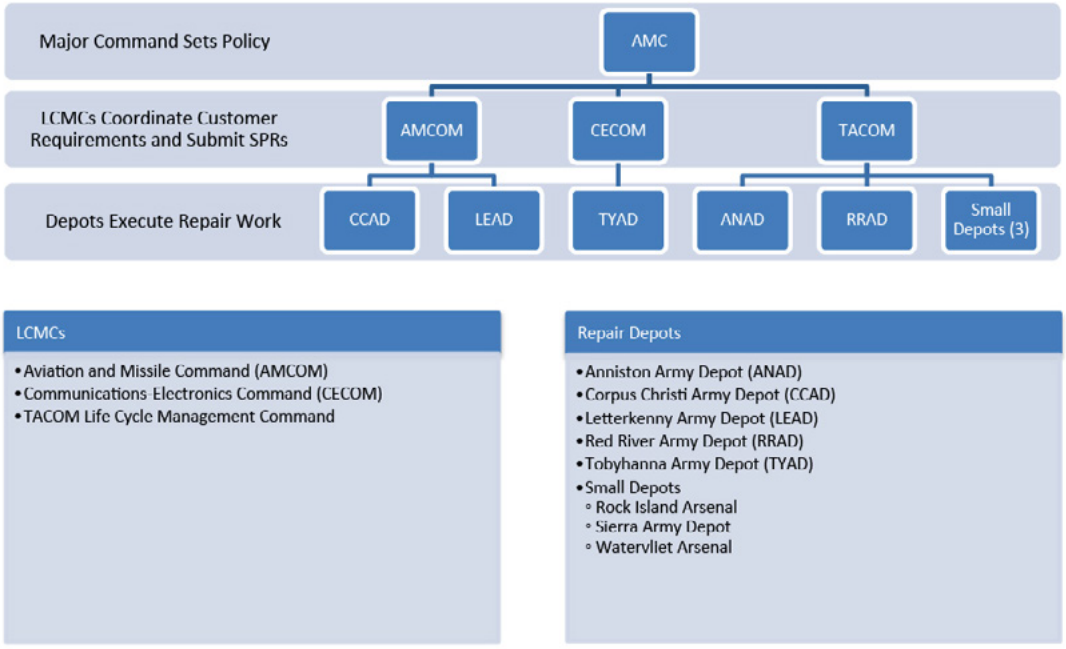
Background

DoD Manual 4140.01, Volume 2, "DoD Supply Chain Materiel Management Procedures: Demand and Supply Planning," February 10, 2014,[1] states that DoD Components may use tools such as SPRs for collaborative forecasting between materiel managers and their customers. Through SPRs, customers are able to communicate special future requirements directly to materiel managers, such as DLA, who are responsible for purchasing and supplying the requested material to the customers. The using DoD Components may submit SPRs to the materiel manager to forecast special program or project requirements. The using DoD Components are required to establish internal controls and maintain supporting documentation to ensure the appropriateness and accuracy of SPR submissions, correlate requisitions with related SPRs, and ensure timely and accurate reporting of significant changes.

[1] DoD Manual 4140.01, Volume 2, replaced DoD 4140.1-R, "DoD Supply Chain Materiel Management Regulation," May 23, 2003, which was the governing DoD policy for a significant portion of this audit. The revised manual did not contain significant changes to the forecasting process.

DoD Manual 4140.01 specifies that DoD Components are to use SPRs to forecast future special program or maintenance project requirements that are nonrecurring and may not be included in other forecasts based on recurring historical demand data. For the Army, AMC is responsible for ensuring LCMCs provide SPR forecasts to DLA in sufficient time to acquire parts to meet scheduled requirements. The LCMCs submit changes to DLA to modify or cancel existing SPRs, determine the delivery schedule, and adjust the SPR quantity as necessary for any schedule changes. If the delivery schedule is properly established, the LCMCs are to ensure the correct parts are identified and available to meet the scheduled requirements. Figure 1 shows the AMC structural relationships for the SPR process.

Figure 1. AMC Structural Relationships for the SPR Process



Parts List and Forecasting Process

The LCMCs and depots use the Logistics Modernization Program (LMP) system to plan depot maintenance projects and forecast spare parts requirements to DLA. LCMC personnel load the customer requirements into LMP and create a unique depot maintenance project file. The customer's requirements include details such as:

- Type of equipment needing maintenance
- Number of units requiring maintenance, and
- Type of maintenance required.

This project file is typically prepared years in advance of the depot actually executing the work.

Once LCMC personnel create the project file in LMP, the system uses the customer requirements information to select a parts list, also known as a bill of materials, which fits that type of work. The parts list details the specific parts required to complete the planned project work. Based on the information in the project file and in the parts list, LMP will forecast spare parts requirements to DLA using SPRs. See Appendix B for additional details on this process.

Because LMP uses the parts list to forecast future Army spare parts requirements, the LCMCs and depot teams should retain and analyze all available information to improve them. By ensuring that parts lists are based on the best available data, the LCMCs and depot teams allow for the spare parts forecasting process to function reasonably and also contribute to DLA having the correct number of spare parts available to support depot maintenance programs.

DLA Mitigates Risk of Acquiring Too Much Inventory by Adjusting Purchases Based on Customer's Historical Buyback Rates

DLA is the largest DoD combat support agency, providing worldwide logistics support in both peacetime and wartime to the Military Services. DLA provides nearly all of the consumable items the Services need, including weapon system parts. DLA personnel indicated they consider SPRs along with historical demand from all customers when making purchase decisions. DLA mitigates its risk of purchasing too much inventory by adjusting some of the LCMCs' SPRs by the percentage of the forecast spare part needs that the depots have historically purchased. DLA refers to this as a "buyback rate," which the DLA Office of Operations Research and Resource Analysis (DORRA) calculates by depot and spare part combination based on the forecast orders for the last 12 months and the actual depot orders received (parts ordered/parts forecast on SPRs = buyback rate). For example, if an LCMC submitted an SPR informing DLA that its depot will need 1,000 rings to perform a planned engine overhaul project, but historically the depot only purchased 50 percent of what the LCMC forecast, DLA's system will reduce the forecast to 500 rings (1,000 x 50 percent). DLA will then consider including some or all of the reduced forecast when preparing the item's demand plan and determining the amount of stock to purchase to meet all customer requirements. The buyback rates account for some degree of changes to planned depot work schedules that may

occur throughout the fiscal year because they consider the previous four quarters of SPRs and associated depot orders. For example, if the LCMC forecast a need for rings in April but their depot did not order the rings until September, the orders would still count towards the buyback rate for that given fiscal year. DLA personnel stated the buyback rates are updated at the end of each fiscal year and apply the new rates to future SPRs.

Army Transition from Special Program Requirements to the Army Supply Plan

The Army is transitioning to a new process for sharing future spare parts requirements with DLA, referred to as the Army Supply Plan.[2] LCMC personnel stated that, under the current SPR process, TACOM and CECOM LCMCs transmit future requirements to DLA on a quarterly basis, while the AMCOM LCMC transmits future requirements to DLA on a monthly basis. Currently, DLA will only accept requirements that have a delivery date of up to three years in the future. The Army Supply Plan changes the transaction format, frequency, and future delivery date of the LCMCs' requirement submissions to DLA. The forecasts LCMCs submit will be in a different transaction format and all LCMCs will be transmitting the forecast requirements monthly. In addition, DLA will accept forecast requirements with a delivery date of up to 5 years in the future. However, the internal LMP processes used to develop those forecast requirements will not change. AMC and DLA personnel initially stated that the transition from SPRs to the Army Supply Plan would take place in February 2014 but the estimated transition date has been delayed until October 2014.

Review of Internal Controls

DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013, requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls. We identified an internal control weakness where the Army LCMCs did not provide DLA with reliable forecasts of their future spare parts needs. The forecasts were unreliable because Army policy and controls did not ensure:

[2] According to DoD Manual 4140.01, Volume 2, the Army can use the Army Supply Plan to submit future forecast quantities in place of SPRs. Army personnel can submit future forecast quantities either as an SPR or through the Army Supply Plan, but not both.

- depot personnel maintained reasonable depot overhaul factors (DOFs), or spare parts usage rates, that contribute to the spare parts LMP forecasts;
- LCMC personnel correctly populated the input fields that LMP uses to select the part lists that identify the parts, supply sources, and quantities needed for planned depot maintenance work;
- depot personnel properly coded spare parts in LMP to prevent the system from generating erroneous spare parts forecasts; and
- LCMC personnel maintained adequate supporting documentation for their spare parts forecasts and compared actual depot orders with forecast amounts to ensure the reasonableness of their spare parts forecasts.

We will provide a copy of the report to the senior Army official responsible for internal controls.

Finding

Army Life Cycle Management Commands Did Not Provide the Defense Logistics Agency With Reliable Forecasts of Their Spare Parts Needs

The Army did not provide DLA with reliable forecasts of spare parts needed to support planned depot maintenance programs. Specifically, the Army forecast its depots would order $226.4 million worth of spare parts from DLA during FY 2013. However, the depots did not order $142.7 million (63 percent) of the forecast parts in FY 2013. In addition, the Army ordered $83.7 million in spare parts that they did not forecast.[3] The Army provided unreliable forecasts to DLA because Army policy and controls did not ensure:

- depot personnel maintained reasonable DOFs, or spare parts usage rates;
- LCMC personnel correctly populated data elements which LMP uses to select the part lists that identified the parts, supply sources, and quantities needed for planned depot maintenance work;
- depot personnel properly coded spare parts in LMP to prevent it from generating erroneous spare parts forecasts; and
- LCMC personnel maintained adequate documentation to support their spare parts forecasts and compared actual depot orders with related forecasts to ensure their reasonableness in accordance with DoD policy.

Unreliable spare parts forecasts negatively affect DLA's purchase decisions and associated stock levels. Specifically, DLA either buys too many parts and incurs unnecessary inventory costs or does not purchase enough parts, affecting depot operations and warfighter readiness. The Army submitted spare parts forecasts totaling $705.3 million to DLA for FYs 2014 through 2016. Unless the Army improves these forecasts, it will continue to negatively impact DLA's purchase decisions and stock levels.

[3] The Army ordered spare parts that were more than initially forecast. For example, the Army forecast a need for 50 units of a given spare part to DLA. However, the Army subsequently ordered 70 units indicating that they likely understated the forecast by 20 units. In such an instance, the value of the additional 20 units ordered would be included in the $83.7 million total value that exceeded the forecast.

Army Life Cycle Management Commands Provided Unreliable Spare Parts Forecasts for Planned FY 2013 Depot Maintenance Work

Army LCMCs did not provide DLA with reliable forecasts of spare parts needed to support planned depot maintenance programs. DoD guidance[4] requires DoD components to establish internal controls to ensure appropriate and accurate SPR submissions. It also requires that once a past demand history is available, DoD components will use actual past demand data, supplemented by future program requirements data, to plan for future requirements.

DORRA tracks Army SPR forecasts and associated orders to calculate buyback rates. DORRA makes this data available to the services, and DLA uses the buyback rates to adjust some future SPR forecasts. We obtained DORRA SPR data as of the end of FY 2013, including one year of past SPRs (FY 2013) and associated buyback rates, as well as three years of future SPRs (FY 2014–FY 2016).[5] The DORRA data shows that the Army LCMCs submitted SPR-based forecasts to DLA which predicted Army depots would order $226.4 million worth of spare parts during FY 2013. We analyzed the DORRA data to determine the reliability of the SPR forecasts.[6] Table 1 provides a breakout of the reliability of the Army's SPR forecasts for planned FY 2013 depot maintenance work.

Table 1. Reliability of Army LCMCs' FY 2013 SPR Forecasts

SPR Buy Back Rate	LCMC SPR Value (millions)	Associated Depot Orders (millions)	Over/(Under)-Stated SPR Forecast (millions)
<=100 Percent	$182.0	$39.3	$142.7*
>100 Percent	44.4*	128.1*	(83.7)*
Total	**$226.4***		

* These are broken out by LCMC and depot in Tables 2 and 3. We did not total the over/under stated amounts because they reflect SPRs and orders for different parts. For example, one depot may have ordered fewer truck parts than forecast and another depot may have ordered more helicopter parts than forecast. In regard to depot readiness, these amounts should not offset each other.

[4] DoD Manual 4140.01, Volume 2.

[5] These dates refer to when the LCMCs project that they will order the forecast spare parts to include any additions, modifications, or cancellations through the end of FY 2013.

[6] See Appendix A for additional information on our use of the DORRA data.

Although the LCMCs forecast $226.4 million of spare parts requirements to DLA for planned FY 2013 depot maintenance work, their associated depots only ordered $83.7 million from DLA during FY 2013. Therefore, the LCMCs overstated their forecasts by $142.7 million. Table 2 provides a breakout by LCMC and depot of the value of parts associated with overstated LCMC forecasts.

Table 2. Army SPRs for FY 2013 Planned Depot Work and Overstated Amounts

LCMC and Depot	SPR Value (millions)	Actual SPR Order Value (millions)	SPR Overstatement (millions)
TACOM	$149.6	$54.3	$95.3
Anniston	106.1	40.1	66.0
Red River	41.2	13.7	27.5
3 Other Sites*	2.3	0.5	1.8
AMCOM	61.8	23.1	38.7
Letterkenny	32.8	14.8	18.0
Corpus Christi	29.0	8.3	20.7
CECOM-Tobyhanna	15.0	6.3	8.7
Total	**$226.4**	**$83.7**	**$142.7**

* The other sites are Sierra Army Depot, Rock Island Arsenal, and Watervliet Arsenal.

In addition to the parts for which the LCMCs overstated their forecasts, the Army depots also ordered $83.7 million more of other parts than the $44.4 million that the LCMCs forecast to DLA. Table 3 provides a breakout of the dollar value of spare parts for which FY 2013 depot orders to DLA exceeded the associated LCMC SPR forecasts.

Table 3. Army FY 2013 Depot Orders Exceeding LCMC SPR Forecasts

LCMC and Depot	SPR Value (millions)	Actual Order Value (millions)	SPR Understatement (millions)
TACOM	$26.7	$73.0	$46.3
Anniston	19.0	49.0	30.0
Red River	7.4	22.6	15.2
3 Other Sites*	0.3	1.4	1.1
AMCOM	13.7	41.7	28.0
Letterkenny	8.3	24.6	16.3
Corpus Christi	5.4	17.1	11.7
CECOM-Tobyhanna	4.0	13.4	9.4
Total	**$44.4**	**$128.1**	**$83.7**

* The other sites are Sierra Army Depot, Rock Island Arsenal and Watervliet Arsenal

Depot Overhaul Factors Not Reasonable

Army policy and controls did not ensure depot personnel maintained reasonable DOFs. The DOF affects the quantity of spare parts LCMCs forecast they will need from DLA to support planned depot maintenance programs. Each depot maintenance project contains a list of parts needed to complete the project. The parts list identifies the estimated number of each spare part depot personnel will need to perform maintenance action on one asset.[7] Army technical manuals identify mandatory and discretionary parts that personnel must replace during depot maintenance actions. The number of parts required is based on the previous usage rates for similar maintenance projects and can be less than one in some instances. For example, if a depot overhauls 10 helicopters and replaces 5 cables, the replacement rate is 50 percent. Therefore, the usage rate, or DOF, would be set to 0.5. When the Army builds a future overhaul project for 10 helicopters, it would send DLA a forecast for 5 cables. See Appendix B for more details on this process.

Depot personnel should develop and update DOFs based on parts usage rates from recently completed depot maintenance programs of a similar nature. These usage rates provide a reasonable basis for estimating the quantity of DLA-managed parts necessary for future depot maintenance work. Our review of the applicable Army policy found it was lacking specific details on DOF updates. Specifically, Army Regulation 750-1, "Army Materiel Maintenance Policy," September 12, 2013, only provides the following limited guidance, "Depot parts managers are responsible for updating DOFs in the bill of material upon completion of maintenance programs." AMC, LCMC, and depot personnel all stated that they were not aware of any additional Army policy on the DOF updates.

We analyzed the DOFs for 30 spare parts from parts lists that CCAD and ANAD used to complete depot maintenance actions.[8] For these 30 spare parts, we either observed or requested reviews of the DOFs to determine their reasonableness. These reviews involved depot personnel analyzing parts usage data for recently completed maintenance programs of a similar nature. For 20 of the 30 non-statistically sampled parts, the DOF resulting from the review varied significantly from the DOF listed on the respective parts list(s). Table 4 lists details on the 20 parts which we determined had unreasonable DOFs.

[7] The asset can represent the next higher assembly (*e.g.* a rotor blade assembly) or an end item (*e.g.* a helicopter).

[8] There were a total of 34 parts on which we attempted to analyze the DOFs, however we were only able to make conclusive determinations on 30 of those parts.

Table 4. Listing of 20 Parts with Unreasonable DOFs

Spare Part Description	DOF on Parts List(s)*	DOF Per Review	DOF Variance Between Parts List and Review	Spare Part Unit Price
CCAD - 15 of 21 parts examined had unreasonable DOFs				
Mechanical Housing	1.000	0.000	-100.00%	$3,832
Motor Gear Case	0.100	0.000	-100.00	1,467
Sealing Compound	1.000	0.000	-100.00	708
Plain Hexagon Nut	0.500	0.000	-100.00	407
Ball Bearing*	0.400	0.000	-100.00	6,225
	1.000		-100.00	
Hose and Tube Assembly*	0.900	0.001	-99.89	1,478
	1.000		-99.90	
Seal Fitting Insert*	0.300	0.001	-99.67	280
	3.000		-99.97	
Coupling Clamp	0.500	0.010	-98.00	1,062
Fluid Filter Body*	0.010	0.001	-90.00	1,327
	1.000		-99.90	
Retaining Plate	0.800	0.390	-51.25	1,928
Adapter Flange	1.000	0.630	-37.00	838
Spacer Set	0.400	0.580	+45.00	306
Thermostat	0.350	0.550	+57.14	1,947
Bevel Gear	0.250	0.470	+88.00	9,212
Electronic Parts Kit	0.500	1.000	+100.00	7,816
ANAD - 5 of 9 parts examined had unreasonable DOFs				
Piston*	12.000	0.735	-93.88	312
	13.399	0.000	-100.00	
Piston Ring Set*	14.000	0.490	-96.50	250
	13.162	2.500	-81.01	
Bearing Half Set*	1.000	0.590	-41.00	276
		0.000	-100.00	
Motor Cup	9.000	6.975	-22.50	11,173
Breech Bolt*	0.200	0.466	+132.78	679
		0.962	+381.01	

* Some of the spare parts were tested against multiple parts lists which may have had different DOFs based on the type of maintenance work performed.

For example, ANAD substantially overstated its spare parts forecasts for an Army M88 A1 12-cylinder tank engine overhaul. The applicable Army technical manual specified mandatory replacement of all 12 pistons and 12 piston rings during each overhaul. Therefore, the maximum forecast of pistons and piston rings for one engine overhaul should have been 12 pistons and about 12 piston rings.[9] However, there are five different sizes of pistons and piston rings that depot personnel can choose from based on the condition of the engine. The parts list for the engine overhaul includes a DOF for each of the five sizes of each item, but when taken together, they add up to quantities greater than the depot could possibly use. In total, these DOFs forecast 25 pistons and 35 piston rings of various sizes for each engine overhauled despite the fact that the engine can only contain 12 of each.

Additionally, ANAD personnel stated that they did not always replace each piston with a new item but instead used a combination of new and remanufactured[10] pistons to complete overhauls. ANAD personnel stated they used an average of four new pistons on each overhaul and used remanufactured items to meet the remaining requirements. In contrast, they always replaced the piston rings with new items. We examined a planned FY 2015 overhaul of 29 tank engines which forecast a need for 725 pistons and 1,015 piston rings valued at about $484,000. Based on analysis of past parts usage data, a more reasonable forecast would be about 127 pistons and 361 piston rings valued at about $125,000. By using a more reasonable DOF, ANAD reduces its piston and piston ring forecasts by 1,252 parts valued at $359,000. ANAD used similar information on four additional M88 A1 tank engine overhaul projects and also likely overstated their associated piston and piston ring forecasts on these four projects by approximately 2,288 parts valued at $657,000.[11] ANAD personnel acknowledged the existence of additional parts that exceeded actual usage on this same parts list and others.

By using a more reasonable DOF, ANAD reduces its piston and piston ring forecasts by 1,252 parts valued at $359,000.

[9] Depot personnel noted that piston rings are sometimes broken during installation. Therefore, they could possibly use slightly more than 12 piston rings to overhaul 1 engine.

[10] This represents the process of performing repairs or maintenance on a used part or piece of equipment so that depot personnel can reuse it instead of purchasing a new part.

[11] Calculation based on assumption that these similar projects would result in similar parts consumption as the project reviewed.

Army needs to provide policy and develop a methodology for the depots to consistently review parts periodically and adjust their estimates (DOFs) accordingly.

Coding Errors Caused Incorrect Parts List Selections

Army policy and controls did not ensure that LCMC personnel correctly populated data elements which LMP used to select the parts list that identified the parts, supply sources, and quantities needed for planned depot maintenance work. LCMCs build projects and LMP forecasts requirements several years before the depots perform the planned depot maintenance. LCMC personnel develop parts lists in LMP, which identify specific parts associated with planned depot maintenance projects. Each depot maintenance project identifies the list of parts needed to complete the specific project. The LCMCs use LMP to develop, manage, and execute Army depot overhaul programs. LCMC personnel establish projects within LMP, which includes populating four key data elements to reflect:

- the type of work to be performed (work performance code),
- the military service for which the overhaul will be completed (customer code),
- the specific work to be performed (scope of work), and
- whether the work is for a DoD or Foreign Military Sales customer (country code).

Based on the data elements, LMP selects a specific parts list and forecasts spare parts needed to support a planned depot maintenance project. AMCOM officials informed us that if all key data elements do not match, the LMP system logic causes it to select the first available parts list. To complicate matters, each of these data elements must be filled out multiple times because of the various project levels within LMP. In cases where equipment has more than one associated parts list, improper coding may result in the LMP selecting the wrong parts list.

We identified inconsistencies in the parts list selection process that resulted in the submission of unreliable spare parts forecasts to DLA. Specifically, AMCOM personnel incorrectly populated key LMP data elements, which caused LMP to select the wrong parts list and generate erroneous forecasts. For example, LMP

overstated a forecast for isolators,[12] which varied significantly from what CCAD needed for planned maintenance on helicopter tail rotor blades. When AMCOM personnel established the associated project in LMP, they did not completely and consistently fill in all data elements, causing LMP to select the wrong parts list. As a result, LMP erroneously forecast to DLA that CCAD needed 9,060 isolators, valued at $4.5 million, to perform the overhaul. In this instance, AMCOM personnel did not populate the country code data element in LMP, which resulted in the system selecting the wrong parts list. CCAD personnel informed us that the actual tail rotor blade overhaul project required an isolator that CCAD obtained from a supply source other than DLA. However, LMP generated invalid SPRs because the incorrect parts list LMP selected identified DLA as the supply source. Because of our inquiries, AMCOM personnel subsequently cancelled all of the associated SPRs for the isolators.

LMP erroneously forecast to DLA that CCAD needed 9,060 isolators, valued at $4.5 million, to perform the overhaul.

In addition, we identified 100-planned CCAD maintenance projects for FYs 2014 and 2015 that contained missing data element(s) in LMP at some level.[13] The missing data element(s) were either the scope of work, country code, or both and could have caused LMP to select the wrong parts list. We non-statistically sampled 4 of the 100 planned maintenance projects to determine whether the forecast parts reconciled to the actual parts CCAD needed to complete them. One of the four projects forecast erroneous spare parts requirements because AMCOM personnel did not identify the scope of work and country code, which resulted in LMP selecting the wrong parts list. The incorrect parts list selected contained four unique parts. Three of these were parts that CCAD would not purchase from DLA but would instead obtain from other supply sources. In contrast, the parts list that LMP should have selected, and that reflects the parts CCAD would actually use to complete the overhaul project, contained 14 unique parts that CCAD would generally order from DLA. We calculate that the erroneous forecasts associated with these parts would total as much as $487,000. Overall, LMP could have selected the wrong parts list and generated invalid spare parts forecasts for other projects.

[12] Isolators help control vibrations. Each UH-60 helicopter tail rotor blade overhaul calls for the mandatory replacement of 4 isolators.

[13] The missing data element(s) were at the project level, funded project level, or unfunded project level as a portion of a planned project can be fully or partially funded and unfunded.

Training, oversight, the addition of LMP edit checks, the comparison of SPRs to depot orders, or a combination of these, could help LCMC personnel correctly populate key data elements and reduce erroneous forecasting. AMC should also consider requesting AMCOM personnel to review planned CCAD maintenance projects and correct any forecasts that LMP generated using the wrong parts list.

Incorrect Parts Coding Generated Erroneous Forecasts

Army policy and controls did not ensure that depot personnel properly coded parts in LMP to prevent it from generating erroneous spare parts forecasts to DLA. As a result, the Army depots did not order the associated parts from DLA but instead used existing depot stock on hand or obtained parts from other supply sources to complete FY 2013 depot maintenance work.

The LMP master record for each part contains settings that determine whether the system will generate a forecast. Depot personnel update these settings periodically if the part's supply status changes. If depot personnel do not make the proper updates, LMP will generate an erroneous parts forecast and submit it to DLA.

For example, LMP forecast ball bearing requirements to DLA for use in planned CCAD maintenance work. However, CCAD personnel had also coded the item in LMP to provide notification when stock on hand drops to a specified minimum level. When LMP provides notification, CCAD personnel manually order a specified amount of stock from DLA to allow the CCAD on-hand balance to increase to a predetermined maximum level, which is approximately an 18 month supply. CCAD personnel stated that LMP should not forecast requirements to DLA for items coded in this manner because the forecast is based on planned depot maintenance work and not the quantity the depot will actually order once the minimum level is reached. However, we determined that CCAD did not properly code these items in LMP, which caused LMP to generate erroneous forecasts to DLA. In response to our inquiry, CCAD provided a list of 15,059 parts they established as manual reorder point items in LMP as of January 2014. We matched this list to DLA's list of future SPRs for planned CCAD maintenance work and identified 1,923 unreliable SPRs for 1,134 unique parts valued at $5.4 million. These forecasts are unreliable because CCAD periodically fulfills the requirements by placing manual orders when LMP identifies parts have dropped to their specified minimum level.

We identified 1,923 unreliable SPRs, valued at $5.4 million, for 1,134 unique parts coded as manual reorder point items.

We notified AMCOM LCMC personnel of this miscoding and they initiated corrective actions to identify and cancel the associated SPRs and to make sure that CCAD personnel assigned the correct codes to prevent future erroneous SPRs.

In another example, LMP forecast lock washer requirements to DLA for planned ANAD maintenance work. However, ANAD had also coded the item in LMP as having vendor managed inventory and informed us that they had not ordered the item from DLA in more than 2 years. ANAD personnel stated that a vendor monitors the maintenance line stock on hand and resupplies it as necessary. Therefore, LMP should not be submitting forecasts to DLA. TACOM personnel stated that ANAD personnel did not properly code these items in LMP, which allowed LMP to generate and send erroneous forecasts to DLA. ANAD provided us a list of 8,789 parts they coded as vendor managed inventory in LMP as of January 2014. We matched this list to DLA's list of future SPRs for planned ANAD maintenance work and identified 1,173 unreliable SPRs for 241 unique parts valued at $1.8 million. These forecasts duplicate requirements that vendors already support.

TACOM LCMC personnel informed us that they met with ANAD and contractor personnel in March 2014 to determine the appropriate actions to correct this issue. TACOM personnel informed us that they needed time to research a pending LMP change and determine how it will impact the ability to turn forecasting on and off for vendor managed inventory.

We determined that the inaccurate coding caused LMP to generate and send erroneous forecasts to DLA. LCMC personnel stated that there are specific LMP fields that depot personnel should change in order to prohibit LMP from sending the erroneous forecasts.

AMC should develop policy to make sure depot personnel are aware of actions they need to take in coding LMP to prohibit it from generating and sending erroneous forecasts. In addition, in light of the problems identified, AMC should review existing coding for spare parts in the Army LMP system and cancel all unintended SPRs submitted to DLA for planned depot maintenance projects.

Life Cycle Management Commands Not Maintaining Adequate Supporting Documentation or Comparing Forecasts to Related Orders

LCMC personnel did not maintain adequate documentation to support their SPRs and did not compare actual depot orders with related forecasts to ensure their reasonableness. DoD Manual 4140.01 specifies that DoD Components are required to establish internal controls and maintain supporting documentation to ensure the appropriateness and accuracy of SPR submissions, correlate requisitions with related SPRs, and ensure timely and accurate reporting of significant changes. However, limitations with the LMP system impaired the ability of LCMC personnel to fully comply with DoD policy.

We non-statistically sampled 28 parts and $9.7 million in associated stock that AMCOM and TACOM LCMCs forecast they would need from DLA in FY 2013 to support planned CCAD and ANAD maintenance programs. For the 28 parts, DLA buyback rates showed that CCAD and ANAD either did not place any orders or placed orders that varied significantly from the LCMC-forecast quantities. In order to determine why the orders did not correlate with the related SPRs, we requested LCMC personnel provide documentation supporting the forecast quantities[14] for the sampled parts. LCMC personnel informed us that they could not provide documentation supporting the SPRs because the LMP system did not retain support for SPRs associated with completed projects.

LCMC and depot personnel could not provide documentation supporting past SPRs because of LMP system limitations.

CCAD and ANAD personnel also informed us that they could not provide supporting documentation. However, LCMC and depot personnel researched current item coding, ordering and usage data, stock levels, current parts lists and associated DOFs, and supply sources for our sampled parts. Based on this research they provided the following possible reasons why the depots either did not order any parts or why their orders varied significantly from the quantities that the LCMCs forecast to DLA: [15]

[14] Supporting documentation includes the parts list, DOFs, number of assets scheduled to be repaired or overhauled, and the planned timeframe for the project (including the expected monthly inductions) that LMP used to calculate the forecast.

[15] We were unable to validate the legitimacy of the reasons provided for the unreasonable forecasts because the supporting documentation was not maintained.

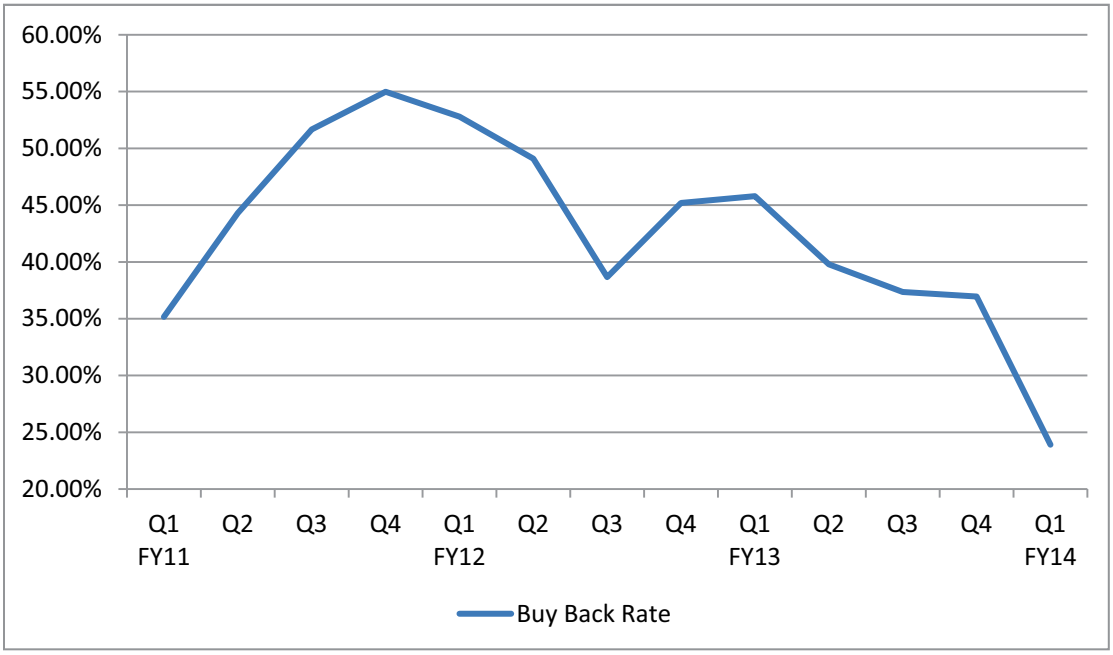
- LMP selected the wrong parts list,
- depot used on-hand stock to satisfy maintenance requirements,
- original equipment manufacturer or another vendor supplied the needed parts,
- parts lists contained inaccurate DOFs, and
- depots experienced maintenance schedule change or work stoppage.

LCMC personnel did not establish a formal process to compare forecasts to related orders to ensure SPR reasonableness. DORRA buyback data showed that for FY 2013, Army depots only ordered 37 percent of the value of spare parts Army LCMCs forecast they would need from DLA. We discussed the DORRA buyback rates with LCMC personnel and they cited concerns with the accuracy of the rates. We asked LCMC personnel if they had established a similar methodology to compare depot orders with SPRs and they informed us that they had not. Therefore, they did not have sufficient information to challenge the accuracy of DLA's rates or have sufficient information to improve the reasonableness of their SPRs. Concerning ensuring timely and accurate reporting of significant changes, LCMC personnel informed us that they frequently respond to e-mails and phone calls from DLA personnel requesting validation of some SPRs.

Our review of DORRA buyback rates for Army depots over the past three years shows that the rates are declining, which indicates that the LCMCs' spare parts forecasts are getting less reliable. Figure 2 shows this concerning trend of Army buyback rates that DORRA calculated between the first quarter of FY 2011 and the first quarter of FY 2014.[16]

[16] The buyback rates are calculated on a combination of the preceding four quarters of forecast and order data. For example, the buyback rate for first quarter (1Q) FY 2011 is based on forecasts and related orders for the period of January 2010 through December 2010.

Figure 2. Trend of Declining Army Depot Buyback Rates



AMC personnel informed us that as part of their transition to the Army Supply Plan they are developing a methodology to compare forecasts to related orders to ensure SPR reasonableness. To allow for greater consistency and accuracy of their results they plan to use both LMP and DLA data. As part of this process, AMC plans to develop metrics and calculate a "demand plan accuracy" for the spare parts forecasts it provides to DLA.

Until the Army transitions to the Army Supply Plan, AMC needs to develop a methodology, to include establishing dollar value review thresholds, for comparing depot orders with SPRs to ensure the reasonableness of their spare parts forecasts.

Unreliable Spare Parts Forecasts Increase the Defense Logistics Agency's Risk of Purchasing Excess Inventory

Unreliable spare parts forecasts contribute to DLA purchasing excess inventory and incurring unnecessary costs. If the LCMCs forecast more than their depots actually need, DLA has an increased risk of purchasing excess inventory and incurring unnecessary costs related to purchasing and holding the inventory. For FY 2013, LCMCs forecast spare parts requirements totaling $142.7 million, which their depots did not order from DLA.

There is not a one for one relationship between the LCMCs' spare parts forecasts and DLA's purchases decisions. DLA makes purchase decisions based on variety of information including consideration of the Army's SPR forecasts. The other information includes the world-wide customer ordering history for a given spare part as well as the current inventory level. However, when DLA initiates purchases based on overstated SPR forecasts, it incurs a variety of costs and consequences:

- Purchasing Costs: DLA incurs purchasing costs both to pay the vendor and to administer the contract and will only recoup these costs if it eventually sells the inventory.
- Holding Costs: DLA incurs storage costs associated with maintaining warehouse space; and if DLA purchases inventory sooner than needed or purchases too much inventory, they will incur unnecessary holding costs.
- Disposal Costs: DLA incurs costs for disposing excess, obsolete, or expired inventory because many items require special procedures relating to environmental impact or demilitarization requirements.

For example, AMCOM forecast a requirement for 257 fluid filters that CCAD would order from DLA between July 2013 and September 2014 for planned maintenance work. DLA issued contracts in FY 2013 to purchase 117 fluid filters at a cost of $102,375 to supplement the 149, which DoD EMALL[17] showed they already had on hand. DoD EMALL data also showed that customers only ordered six fluid filters in the two years preceding DLA awarding of these contracts. At this ordering rate, the 149 units already on hand represented about 50 years' worth of stock. CCAD personnel informed us that the SPR forecasts to DLA for fluid filters were invalid because CCAD typically obtains them from another supply source and in much smaller quantities. As a result, DLA spent $102,375 for parts they are unlikely to sell and that will potentially result in unnecessary inventory holding and other costs.

[17] DoD EMALL is a web-based online ordering system established to provide a full service electronic commerce site for use by DoD organizations to find and acquire goods and services.

Unreliable Spare Parts Forecasts Negatively Impact Depot Readiness and Increase Spare Parts Costs

The LCMCs' unreliable forecasts also contributed to DLA being unable to fully support Army depot requirements. If the LCMCs forecast less than their depots actually need, or DLA applies buyback rates and reduce valid forecasts because of poor depot ordering history, DLA may not purchase sufficient inventory to support the depot's requirements. The insufficient purchases of parts can impact Army readiness by causing work stoppages at the depots or cause them to incur additional costs to obtain the parts through small, rushed purchases from another supply source at a significantly increased price. Reliable forecasts are especially important because it can take DLA over a year to purchase and deliver parts the depots need to complete maintenance programs. Therefore, once a shortage occurs it can take a long time to remedy. For FY 2013, Army depots ordered spare parts totaling $83.7 million, which LCMCs did not forecast to DLA.

The LCMCs' understated forecasts contributed to 27 critical spare parts shortages at CCAD and ANAD. For example, housings first appeared on ANAD's critical item shortage report in July 2013. In this instance, TACOM submitted SPRs to DLA for 1,248 housings for planned FY 2013 ANAD maintenance work but ANAD actually ordered 1,904 housings. This 656 unit difference, valued at $1.2 million, is included as part of the $83.7 million which the Army ordered in excess of their SPR forecasts during FY 2013. This item was still present on ANAD's critical item shortage report in March 2014.

Further, depots have paid considerably higher prices to purchase parts from other supply sources to prevent or shorten work stoppages when they were unable to obtain spare parts from DLA. For example, ANAD personnel provided documentation showing that when they were unable to obtain bearings from DLA to support a FY 2012 maintenance project they paid $2,975 apiece to obtain bearing sets that they previously purchased from DLA for $178. As another example, CCAD personnel provided documentation showing that when they were unable to obtain couplings from DLA to support a FY 2014 maintenance project they paid $1,500 apiece to obtain couplings that DLA sold for $301 apiece.

ANAD paid $2,975 apiece to obtain bearing sets that they previously purchased from DLA for $178.

Conclusion

The Army can reduce the associated risks that impact DLA's purchase decisions and minimize the related costs and consequences by addressing the problems this audit identified and improving the reliability of its SPR forecasts. DORRA data showed that for FY 2013, Army depots only ordered 37 percent of the value of spare parts Army LCMCs forecast they would need from DLA. In addition, our analysis of Army depot buyback rates shows that they have been declining over the past three years, which indicates that the LCMCs' forecasts are getting less reliable. The Army continues to provide DLA with significant forecasts of its future spare parts requirements. Specifically, DORRA data shows that the Army has provided DLA with SPRs valued at $705.3 million to support planned depot maintenance work for FY 2014 through FY 2016. Considering the significant dollar value associated with the Army's future forecasts, even slight improvements could have a major impact on DLA's purchase decisions and associated stock levels.

Recommendations, Management Comments, and Our Response

Recommendation 1

We recommend that the Secretary of the Army direct the Deputy Chief of Staff G-4 (Logistics) to develop Army-wide policy and establish controls on monitoring and updating depot overhaul factors consistently. At a minimum, the policy should prioritize depot overhaul factor reviews for items with low demand plan accuracy or buyback rates as well as for projects that require high-volume, high-dollar parts. The policy should address the frequency and priority of the updates and consider more frequent reviews for specific items deemed high priority.

Assistant Secretary of the Army Comments

The Director of Supply, Office of the Deputy Chief of Staff, G-4, answering for the Assistant Secretary of the Army, agreed with the responses provided below by AMC, agreeing with the finding but not the recommendation. The Director of Supply stated that Army policy already exists in Army Regulation 750-1 but may be adjusted by an integrated process team review, which will conclude in June of 2015.

Army Materiel Command Comments

The Executive Deputy to the Commanding General, AMC, agreed with the finding but not the recommendation, stating that the necessary policy is already in place. The Executive Deputy stated that in response to the finding, AMC is initiating a depot material requirements planning integrated process team that will address DOF management, among other matters. The expected outcomes of the team include clarifying guidance and the development of internal controls and methodologies for DOF reviews. The target competition date is June 2015 with implementation scheduled June 2015 through January 2016 and ticket management for any supporting LMP implementation set for FY 2017.

Our Response

We acknowledge that at the time of the audit, there was Army policy requiring depot parts managers to adjust DOFs at the closure of a depot maintenance program. However, the policy does not address the frequency or methodology for performing overhaul reviews. Audit results showed that sufficient controls were not in place to ensure responsible depot personnel reviewed and adjusted DOFs consistently or in timely manner. However, we believe the Executive Deputy's plan to establish a depot material requirements planning integrated process team that will address DOF management by clarifying guidance and developing internal controls and methodologies addresses the intent of our recommendation. Therefore, no further comments are required.

Recommendation 2

We recommend that the Commander, Army Materiel Command, develop a plan of action with milestones to improve the accuracy of the spare parts forecasts that Army Life Cycle Management Commands provide to the Defense Logistics Agency. The plan should address the issues this report identified and include:

a. Establishing procedures and controls that ensure Life Cycle Management Command personnel use the correct parts lists to identify the parts, supply sources, and quantities needed for future depot maintenance work. The plan should consider training, the addition of edit checks in the Logistics Modernization Program, the comparison of forecasts and depot orders, or a combination of these actions. In addition, the plan should consider requesting Aviation and Missile Life Cycle Management Command personnel to review planned Corpus Christi Army Depot maintenance projects and correct any forecasts that the Logistics Modernization Program developed using the wrong parts list.

Army Materiel Command Comments

The Executive Deputy to the Commanding General, AMC, responding for the Commander, agreed with the finding and recommendation. The Executive Deputy stated that corrective actions regarding AMCOM have been implemented or are projected to be completed by September 30, 2014. The Executive Deputy also stated that the depot material requirements planning integrated process team, initiated in response to audit report recommendation 1, will have additional objectives to address training, procedures, controls, and necessary policy for selection of parts, sources, and quantities, as well as data correction actions relative to existing programs. Furthermore, the team will address the business process and system logic to prevent incomplete or erroneous data entry. The team will also implement metrics to manage parts forecasts issued to DLA. The target competition date is June 2015 with an implementation schedule of June 2015 through January 2016 and ticket management for any supporting LMP implementation set for FY 2017.

Our Response

Comments from the Executive Deputy addressed all specifics of the recommendation, and no further comments are required.

b. Establishing procedures and controls that ensure depot personnel accurately code spare parts in the Army Logistics Modernization Program system to prevent the system from generating erroneous spare parts forecasts to the Defense Logistics Agency. In addition, the plan should involve requesting depot personnel to review existing spare parts coding in the Army Logistics Modernization Program system and cancel all related existing erroneous special program requirements for future maintenance projects submitted to the Defense Logistics Agency.

Army Materiel Command Comments

The Executive Deputy to the Commanding General, AMC, responding for the Commander, agreed with the finding and recommendation, stating that AMC will develop policy and guidance to prevent erroneous forecasts, such as those identified in the report. In addition, the Executive Deputy stated that the transition to the Army Supply Plan in October 2014 will automatically cancel unintended SPRs, resolving any remaining erroneous forecasts.

Our Response

Comments from the Executive Deputy addressed all specifics of the recommendation, and no further comments are required.

c. Until the Army transitions to the Army Supply Plan, developing a methodology for the Life Cycle Management Commands to compare depot orders with associated special program requirements in order to ensure the reasonableness of spare parts forecasts. The methodology should include using the Defense Logistics Agency's buyback rates or developing Army-calculated ordering rates for Army depots and also establishing dollar value review thresholds to prioritize high dollar forecasts.

Army Materiel Command Comments

The Executive Deputy to the Commanding General, AMC, responding for the Commander, agreed with the finding and recommendation, stating that as part of the transition to the Army Supply Plan, AMC will be implementing metrics to monitor forecasts and orders, as well as to document changes in forecasts. In addition, AMC has established closer collaboration with DLA to change forecasts. The target completion of Army Supply Plan implementation is October 2014.

Our Response

Comments from the Executive Deputy to the Commanding General did not address all specifics of the recommendation. However, both AMC and DLA confirmed that the implementation of the Army Supply Plan is scheduled for October 2014. Therefore, the proposed actions meet the intent of the recommendation, and no further comments are required.

Appendix A

Scope and Methodology

We conducted this performance audit from September 2013 through July 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We reviewed the following applicable guidance:

- DoD Manual 4140.01, Volume 2, "DoD Supply Chain Materiel Management Procedures: Demand and Supply Planning," February 10, 2014,
- Defense Logistics Manual 4000.25-2, "Military Standard Transaction Reporting and Accountability Procedures," June 13, 2012, and
- Army Regulation 750-1, "Army Materiel Maintenance Policy," September 12, 2013.

We contacted personnel from the Department of the Army, AMC headquarters, DLA headquarters, and DORRA. We selected two AMC LCMCs to audit, AMCOM and TACOM. We conducted site visits to TACOM, located in Warren, Michigan; CCAD, located in Corpus Christi, Texas; and ANAD, located in Anniston, Alabama.

We reviewed the Army processes for estimating and forecasting spare parts requirements to DLA. We obtained historical and future Army SPR transaction data from DORRA. We verified information contained in the DORRA data and the Army LMP. We selected a non-statistical sample of 34 spare parts on which to perform DOF testing. Twenty five of these spare parts were chosen in advance of site visits from the DORRA SPR data based on factors including their past buyback rates and value of outstanding SPRs. An additional nine spare parts were chosen judgmentally while on site at CCAD. We compared the number of parts used on recently completed similar maintenance projects to determine whether the depots were updating the DOFs and using the best available information to prepare future forecasts in accordance with DoD policy. We selected an additional non-statistical sample of 28 parts based on DORRA data indicating that the Army purchased only 0-55 percent of the orders which they forecast for FY 2013. We interviewed LCMC and depot personnel and reviewed documentation to determine why

these parts were not ordered as forecast. We observed Army personnel and processes associated with SPR forecasting; interviewed analysts, program managers and depot maintenance personnel; and reviewed and analyzed documents to determine whether Army personnel properly followed applicable criteria.

Use of Computer-Processed Data

We used computer-processed data extracted from DORRA, LMP, and DoD EMALL.

DORRA personnel informed us that the SPR population data they provided was extracted from the DoD EMALL system and the DLA Enterprise Business System and compiled into Excel spreadsheets. The Excel spreadsheets listed Army:

- Past SPRs and associated DORRA-calculated Buyback Rates, and
- Future SPRs DORRA extracted from the DLA Enterprise Business System.

The historical and future SPR transactions DORRA extracted from the DLA Enterprise Business System are requirements generated by the Army LMP system and submitted to DLA. In order to test the reliability of the DORRA data, we re-ran DORRA's calculation of buyback rates and related figures and examined the data for duplicates and other anomalies. We further tested this SPR data through our requirements testing with the Army. Specifically, we used the data to test the Army SPR requirements determination process and used non-statistical methods to sample future SPRs as well as the historical SPRs with little or no associated depot orders to determine how the Army LMP system calculated the SPR quantities, and whether or not those quantities were reliable.

The data we obtained from the Army LMP system was in the form of screen shots and Excel spreadsheets. The Excel spreadsheets listed Army depot:

- Parts usage (consumption) histories,
- Parts order histories, and
- Parts extracts coded as either vendor managed inventory or as manual reorder point inventory.

The usage and order histories were used to evaluate the reasonableness of the DOFs listed on parts lists the depots used to complete planned maintenance projects. The LMP system usage histories reflect the quantities of a particular

part that depot personnel used to perform a previous overhaul project of a similar nature. We obtained corroborating evidence from depot personnel and determined that the parts usage histories were sufficiently reliable for our purposes.

We identified unreliable SPRs and DOFs and the details on these deficiencies are provided in the finding section of this report.

Prior Audit Coverage

During the last 10 years, the Government Accountability Office (GAO) and the Department of Defense Inspector General (DoD IG) issued three reports discussing spare parts forecasting. Unrestricted GAO reports can be accessed over the internet at http://www.gao.gov. Unrestricted DoD IG reports can be accessed over the internet at http://www.dodig.mil/pubs/index.cfm.

GAO

Report No. GAO-10-469, "Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts," May 2010

Report No. GAO-09-199, "Army Needs to Evaluate Impact of Recent Actions to Improve Demand Forecasts for Spare Parts," January 2009

DoD IG

Report No. D2005-020, "Defense Logistics Agency Processing of Special Program Requirements," November 17, 2004

Appendix B

Special Program Requirement Generation Process

The SPR forecasting process consists of four primary steps.[18] The process is described below and illustrated on page 30.

1. Personnel at the relevant Army LCMC build a project in the Army's LMP system based primarily on customer requirements. In addition to other information, the project in LMP contains:

   A. The project's end item: This is the item on which the depot performs maintenance. It can be a full piece of equipment such as a tank, or can be a component such as an engine. In the accompanying flowchart, "Item XYZ" is identified as the project end item.

   B. The nature of the project work: Personnel use several data elements in LMP to describe the work depot personnel will perform for the project. These indicate the type of work performed (work performance code), an identification of the customer (customer code), whether the work is for a DoD or Foreign Military Sales customer (country code), and additional specifics on the work performed (scope of work code).

   C. The project quantity: The project also indicates a quantity of end items depot personnel will work on over the course of the project. In the accompanying flowchart, the project quantity is 10.

2. LMP selects a parts list that depot personnel will need to use to complete the project work (commonly known as a "bill of materials"). In advance of the project being built, Army personnel (typically at the depots) will have loaded one or more possible parts lists into LMP for each project end item. When this process works correctly, LMP will evaluate the preloaded parts lists for the project end item and choose the parts list which best matches the nature of the project work. In the accompanying flowchart, Parts List 2 is chosen.

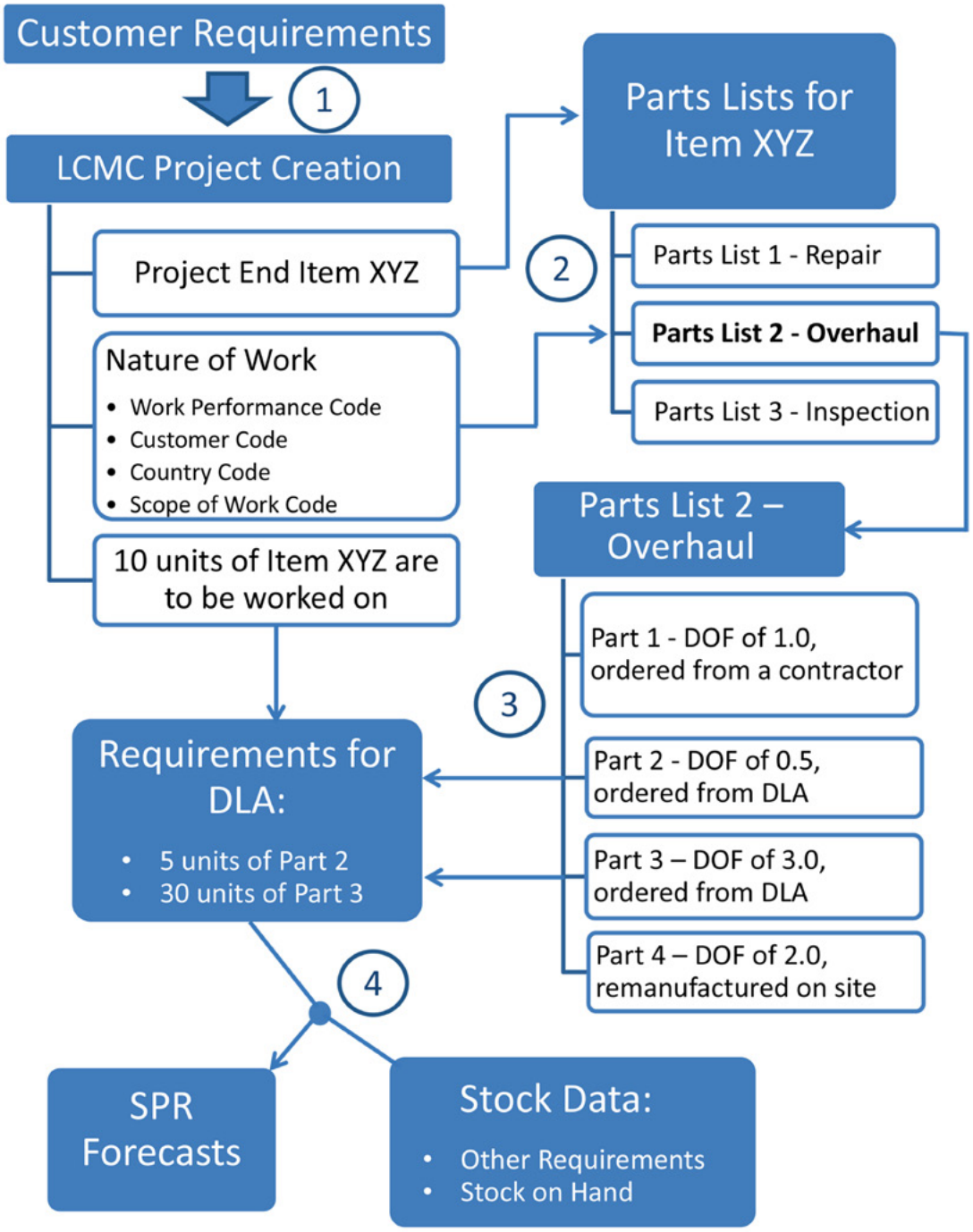
[18] This is a simplification of the process, focused on the details most useful for readers of this report.

3. LMP uses the chosen parts list to generate a list of required spare parts, along with the supply source the depots will obtain the parts from; DLA or another supply source such as a vendor. For each required part, the parts list includes the number of units of the part the depots will require to complete one project end item (known as a DOF). For the items the depots procure from DLA, LMP multiplies the DOF by the project quantity, resulting in the total number of DLA-sourced parts. In the accompanying flowchart, the depots only order Part 2 and Part 3 from DLA and these parts have DOFs of 0.5 and 3.0, respectively. Multiplying the DOFs by the project quantity of 10, LMP forecasts a requirement for 5 units of Part 2 and 30 units of Part 3.

4. LMP combines the total requirement for DLA-sourced parts with other stock information to produce SPRs. This includes combining the project's requirements with other project's requirements for the same parts. LMP then nets the total requirement against any parts the depot already has on hand and has not specifically designated to other projects. This net forecast requirement is then transmitted to DLA on one or more SPRs.

The figure on the following page shows the process as described above, with numbering corresponding to the four steps in the SPR generation process.

Figure. SPR generation process



Management Comments

Assistant Secretary of the Army

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-4
500 ARMY PENTAGON
WASHINGTON, DC 20310-0500

DALO-SUS

9/9/2014

MEMORANDUM THRU ACTING DEPUTY CHIEF OF STAFF, G-4, 500 ARMY PENTAGON, WASHINGTON, DC 20310

FOR U.S. ARMY AUDIT AGENCY, SAAG-PMO-L, 3101 PARK CENTER DRIVE ALEXANDRIA, VA 22302

SUBJECT: Army Response to the Department of Defense, Office of Inspector General Report: Army Needs to Improve the Reliability of the Spare Parts Forecasts It Submits to the Defense Logistics Agency (13AG-0231) (Project Number: D2013-D000AG-0231.000)

1. This is in response to the U.S. Army Audit Agency request for comment on enclosed report.

2. The Army concurs with the U.S. Army Materiel Command response, which is to agree with all findings, but object to the recommendation 1, and to provide policy for depots to periodically review parts estimates.

3. The policy already exists in Army Regulation 750-1, but may be adjusted by the Integrated Process Team review which will conclude in June of 2015.

4. The point of contact is [redacted], or e-mail: [redacted].

Encl

MICHAEL B. CERVONE
Director of Supply

for the country

Army Materiel Command

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MATERIEL COMMAND
4400 MARTIN ROAD
REDSTONE ARSENAL, AL 35898-5000

REPLY TO ATTENTION OF:

AMCIR

AUG 2 9 2014

MEMORANDUM FOR Department of Defense Inspector General (DoDIG), ATTN: [redacted], Program Director, Acquisition, Parts, and Inventory Audits, 4800 Mark Center Drive, Alexandria, VA 22350-1500

SUBJECT: Command Comments on DoDIG Draft Report; Army Needs to Improve the Reliability of the Spare Parts Forecasts It Submits to the Defense Logistics Agency, Project D2013AG-0231

1. The U.S. Army Materiel Command (AMC) has reviewed the subject report and provides the enclosed response.

2. The AMC point of contact is [redacted] or email:[redacted]

Encl

JOHN B. NERGER
Executive Deputy to the
Commanding General

Army Materiel Command (cont'd)

Response to DoDIG Audit D2013-D000AG-0213.000 "Army Needs to Improve the Reliability of the Spare Parts Forecasts it Submits to the Defense Logistics Agency"

Audit Finding	Army Life Cycle Management Commands Did Not Provide the Defense Logistics Agency With Reliable Forecasts of Their spare Parts Needs Army Life Cycle Management Commands Provided Unreliable Spare Parts Forecasts for Planned FY 2013 Depot Maintenance Work Depot Overhaul Factors Not Reasonable
Audit Recommendation	Army needs to provide policy and develop a methodology for the depots to consistently review parts periodically and adjust their estimates (DOFs) accordingly (Recommendation 1).

Response: AMC concurs with the finding but does not concur with the recommendation. AMC and its component organizations acknowledge the Depot Overhaul Factor (DOF) issue. However, the audit report should concede that necessary policy is already in place. CPM 750-2 (2.b.3.b) discusses the required adjustment to DOF at closure of a program and AR 750-1 (5-19.b(3)) states that depot parts managers are responsible for updating the DOF upon completion of maintenance programs. These policies are specific regarding what needs to be done and when it needs to be accomplished. Therefore, additional policy is not necessary. DOF management needs to consider unknown variables that can only be estimated prior to the beginning of the repair program such as the report example citing the use of different sizes of pistons and piston rings based on the condition of the engine. In response to this finding, AMC is initiating a Depot Material Requirements Planning (MRP) Integrated Process Team (IPT) from which one objective will be to address DOF management. Expected outcomes of the IPT include provision of clarifying guidance of and development of internal controls and methodologies for DOF reviews and corrective actions by AMC and its component organizations.

The target completion date for the Depot MRP IPT is June, 2015 with an implementation schedule targeting June, 2015 through January, 2016 and ticket management for any supporting LMP implementation targeted for FY17.

Audit Finding	Coding Errors Caused Incorrect Parts List Selections
Audit Recommendation	Training, oversight, the addition of LMP edit fields, the comparison of SPRs to depot orders, or a combination of these, could help LCMC personnel correctly populate key data elements and reduce erroneous forecast. AMC should also consider requesting AMCOM personnel to review planned CCAD maintenance projects and correct any forecasts that LMP generated using the wrong parts list (Recommendation 2.a).

Response: AMC concurs with both the finding and recommendation. AMC and its component organizations acknowledge the issue of inappropriate parts list selection but would prefer that the audit report acknowledge that corrective action particularly regarding AMCOM has already been implemented. There is a standard to dictate the value for three of the four program data elements that are used to select the preferred parts list (WPC, Customer Code and Country Code). A standard did not exist for the Scope of Work (SOW) field. AMCOM implemented a matrix for MRP SOW where the aviation programs were updated in Production LMP 1QFY14.

1

Army Materiel Command (cont'd)

The LEAD and missile programs are being worked with projected completion being September 30, 2014. Additionally, the Depot MRP IPT discussed above will have as further objectives to address: 1) training, procedures, controls and further necessary policy guidance for the selection of parts, sources and quantities of repair programs as well as data correction actions relative to pre-established programs; 2) enhancement of business processes and the research of the application of termination logic to prevent incomplete and/or erroneous data entry; and 3) the implementation of metrics and additional business processes designed to manage parts forecasts issued to DLA.

The target completion date for the Depot MRP IPT is June, 2015 with an implementation schedule targeting June, 2015 through January, 2016 and ticket management for any supporting LMP implementation targeted for FY17.

Audit Finding	Incorrect Parts Coding Generated Erroneous Forecasts
Audit Recommendation	AMC should develop policy to make sure depot personnel are aware of actions they need to take in coding LMP to prohibit it from generating and sending erroneous forecasts. In addition, in light of the problems identified, AMC should review existing coding for spare parts in the Army LMP system and cancel all unintended SPRs submitted to DLA for planned depot maintenance projects (Recommendation 2.b).

Response: AMC concurs with both the finding and recommendation. AMC and its component organizations acknowledge the issue of incorrect coding that has led to erroneously generated forecasts. AMC will develop policy establishing guidance to its component organizations for determining exclusion parameters that will prevent the issuance of erroneous forecasts such as those identified in the audit report. As a result of the transition to the Army Supply Plan (ASP), previously unintended SPRs will automatically be cancelled thereby resolving any remaining erroneous forecasts for planned depot maintenance projects.

The target completion date for both policy and ASP implementation is October, 2014.

Audit Finding	Life Cycle Management Commands Not Maintaining Adequate Supporting Documentation or Comparing Forecasts to Related Orders
Audit Recommendation	Until the Army transitions to the Army Supply Plan, AMC needs to develop a methodology, to include establishing dollar value review thresholds, for comparing depot orders with SPRs to ensure the reasonableness of their spare parts forecasts (Recommendation 2.c).

Response: AMC concurs with both the finding and the recommendation. AMC is presently transitioning to the Army Supply Plan (ASP). In the implementation of ASP, AMC will be implementing forecast accuracy and churn metrics in order to identify any variances between forecasts and orders as well as to document changes in forecasts. Additionally, increased collaboration with DLA regarding changing forecasts has been established.

The target completion date for ASP implementation is October, 2014.

Acronyms and Abbreviations

AMC	Army Materiel Command
AMCOM	Aviation and Missile Command
ANAD	Anniston Army Depot
CCAD	Corpus Christi Army Depot
CECOM	Communications-Electronics Command
DLA	Defense Logistics Agency
DoD IG	DoD Inspector General
DOF	Depot Overhaul Factor
DORRA	DLA Office of Operations Research and Resource Analysis
GAO	Government Accountability Office
LCMC	Life Cycle Management Command
LEAD	Letterkenny Army Depot
LMP	Logistics Modernization Program
RRAD	Red River Army Depot
SIPRNET	SECRET Internet Protocol Router Network
SPR	Special Program Requirement
TYAD	Tobyhanna Army Depot


INSPECTOR GENERAL
INTEGRITY
EFFICIENCY
DEPARTMENT OF DEFENSE

Whistleblower Protection
U.S. Department of Defense

The Whistleblower Protection Enhancement Act of 2012 requires the Inspector General to designate a Whistleblower Protection Ombudsman to educate agency employees about prohibitions on retaliation, and rights and remedies against retaliation for protected disclosures. The designated ombudsman is the DoD Hotline Director. For more information on your rights and remedies against retaliation, visit www.dodig.mil/programs/whistleblower.

For more information about DoD IG reports or activities, please contact us:

Congressional Liaison
congressional@dodig.mil; 703.604.8324

Media Contact
public.affairs@dodig.mil; 703.604.8324

Monthly Update
dodigconnect-request@listserve.com

Reports Mailing List
dodig_report@listserve.com

Twitter
twitter.com/DoD_IG

DoD Hotline
dodig.mil/hotline

DEPARTMENT OF DEFENSE | INSPECTOR GENERAL

4800 Mark Center Drive
Alexandria, VA 22350-1500
www.dodig.mil
Defense Hotline 1.800.424.9098